REMARKS/ARGUMENTS

Claims 1 - 3, 5 - 16, 18 - 22, 24 - 28, 30 - 42, 44 - 48, 50 - 54, and 56 - 61 are now pending. All of the independent claims 1, 15, 21, 27, 33, 47, and 53 are amended. Dependent claims 3, 5 - 6, 8 - 9, 13 - 14, 20, 26, 32, 34, 38 - 39, 44 - 46, 52, and 60 are also amended.

Claims 9, 13, 14, 38, 39, and 46 are rejected under 35 U.S.C. §112, first paragraph, because according to the Office Action, the disclosure does not teach the use of a third signal between the first and the second signals. Claims 9, 13, 14, 20, 38, 39, and 46 are amended.

As amended, claim 9 recites "receiving a third signal, wherein the adjustment of the multiplied first signal is not based on the received third signal." Figures 2, 3, and 4 show a turbo encoder (200) that includes two trellis encoders (203, 207) that are separated by an interleaver (205). Each trellis encoder (203, 207) outputs a signal that is received by the multiplier (213) after going through the channel (211). Further, the paragraph starting on line 31 of page 4 states: "Any number of trellis encoders separated by interleavers may be used, but two are shown for sake of simplicity." This passage discloses more than the two trellis encoders (203, 207) shown in the figures 2, 3, or 4 and therefore discloses more than two signals received by the multiplier (213). As a result the "third signal" in claims 9, 13, 14, 38, 39, and 46 is fully supported by the specification. Accordingly, it is respectfully requested that the above rejections are withdrawn.

Claims 1 - 3, 5 - 8, 10 - 11, 15 - 16, 18 - 19, 21 - 22, 24 - 25, 27 - 29, 30 - 31, 33 - 36, 40 - 45, 47 - 48, 50 - 51, and 53 - 59 are rejected under 35 U.S.C. §102(a) as being anticipated by Langlais et al., an IEEE publication.

Claims 1 and 33 are amended to further include the limitations of "turbo decoding a signal with adjusted frequency, wherein the Viterbi decoding is independent of the turbo decoding." (Underlining added for emphasis). Claims 1 and 33, as amended, are clearly distinguishable from Langlais that uses a partially processed output from the turbo decoder's Viterbi algorithm as an input to its phase detector.

Figure 2 and the third and fourth paragraphs of page 1 of Langlais indicate: "some decisions called tentative decisions (TD) are extracted from first decoder and are used in the phase recovery system for the calculation of the phase error. A tentative decision is extracted from the turbo decoder during the decoding process, and not after the complete decoding. Although the reliability of the decision improves along with the iterative process, we cannot use a decision with an excessive delay in order to guarantee the stability of the phase-locked loop (PLL) ...." (Underlining added for emphasis). As such, Langlais uses its turbo decoder as part of its phase recovery system or its PLL. In contrast, the claimed invention uses Viterbi decoding to adjust the reference frequency and then turbo decodes the signal with the adjusted reference frequency. Therefore, Langlais does not teach that "the Viterbi decoding is independent of the turbo decoding" as recited by amended independent claims 1 and 33.

Neither does Langlais suggest these amended claims. Langlais makes an express decision to use partially processed values called tentative decisions because it is using the turbo decoder's Viterbi algorithm and not an independent Viterbi decoder. Langlais acknowledges that it is compromising by doing so: "Although the reliability of the decision improves along with the iterative process, we cannot use a decision with an excessive delay ...." Yet Langlais does not propose an independent Viterbi decoder to take the place of the slicer shown in its figure 1 and instead provides a loop back from the turbo decoder to the phase detector.

Independent claim 15, as amended, includes the limitations of "a turbo decoder to turbo decode a signal with adjusted reference frequency, wherein the adjusting of the multiplied first signal by the Viterbi decoder is independent of the turbo decoding of the signal with adjusted reference frequency."

Independent claim 21, as amended, includes the limitations of "a turbo decoder coupled to the Viterbi decoder output, wherein the Viterbi decoder decodes a signal input to the Viterbi decoder independently from the turbo decoder."

Independent claim 27, as amended, includes the limitations of "turbo decoder means for turbo decoding a signal having the tuned reference frequency, wherein the adjusting of the multiplied first signal by the Viterbi decoding means is independent of the turbo decoding of the signal having the tuned reference frequency."

Independent claim 47, as amended, includes the limitations of "a turbo decoder for turbo decoding an output of the Viterbi

decoder, wherein the quantizing of the first symbol by the Viterbi decoder is independent of the turbo decoding of the output of the Viterbi decoder."

Independent claim 53, as amended, includes the limitations of "a turbo decoder coupled to the receiver and adapted to accept an output of the receiver as input, wherein the quantizing of the first symbol by the Viterbi decoder of the receiver is independent of the turbo decoder."

As explained above, Langlais uses the turbo decoder which is the destination of the output of its phase recovery system for performing a partial Viterbi decoding on the data. Accordingly, the above amended independent claims are not taught or suggested by Langlais.

Claims 12, 20, 26, 32, 37, 52, and 59 - 61 are rejected under 35 U.S.C. §103(a) as being unpatentable over Langlais in view of Robertson et al. another IEEE publication. These claims depend, directly or indirectly, from independent claims 1, 15, 21, 27, 33, 47, and 53 that are patentable over Langlais. Robertson is directed to turbo trellis coded modulation and does not include phase detection or Viterbi decoding used in a PLL. Therefore, Robertson does not cure the deficiency of Langlais and the independent claims remain patentable over the two cited references, whether taken alone or in combination. Accordingly, the rejected dependent claims 12, 20, 26, 32, 37, 52, and 59 - 61 are also patentable over the cited references, whether taken alone or in combination, for the same reasons that their respective independent claims are patentable and for the additional limitations they include.

Applicants respectfully submit that all of the claims currently pending in this application are patentably distinguishable over the cited reference, and reconsideration and allowance of this application are respectfully requested.

Respectfully submitted,

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